

# PAVEMENT MARKING DECISION MATRIX<sup>A,B</sup>

9/18/2008

| SURFACE TYPE                       | SURFACE CONDITION                     | AADT per Lane |   |   |
|------------------------------------|---------------------------------------|---------------|---|---|
|                                    |                                       | Low           | Medium  | High <sup>1</sup>   |
|                                    |                                       | <15,000       | 15,000-50,000   | >50,000   |
| Asphalt/Open-Graded Surface Course | New (Pavement Life>5yrs)              | waterborne    | tape <sup>3</sup><br>waterborne<br>epoxy <sup>2</sup>             | tape <sup>3</sup><br>epoxy <sup>2</sup>   |
|                                    | Fair (2<Pavement Life<5 yrs)          | waterborne    | waterborne<br>epoxy <sup>2</sup>                                  | tape <sup>5</sup><br>waterborne<br>epoxy <sup>2</sup>   |
|                                    | Poor (Pavement Life<2 yrs)            | waterborne    | waterborne  | waterborne  |
| Concrete                           | New <sup>1</sup> (Pavement Life>5yrs) | waterborne    | tape <sup>3</sup><br>polyurea<br>waterborne<br>epoxy <sup>2</sup> | grooved tape <sup>3</sup><br>grooved polyurea<br>grooved epoxy <sup>2</sup><br>grooved waterborne |
|                                    | Fair (2 yrs<Pavement Life<5 yrs)      | waterborne    | waterborne<br>epoxy <sup>2</sup>                                  | polyurea<br>waterborne<br>epoxy <sup>2</sup>  |
|                                    | Poor (Pavement Life<2 yrs)            | waterborne    | waterborne  | waterborne  |
| Chip Seal/Thin Overlay < 1.5"      | More than 1 year                      | waterborne    | waterborne<br>epoxy <sup>2</sup>                                  | waterborne<br>epoxy <sup>2</sup>  |
|                                    | Less than 1 year                      | waterborne    | waterborne  | waterborne  |



## General Notes:

A. Intended for use as a general guide and is based on performance history in Utah. Projects with special conditions may require independent decisions based on sound engineering judgement.

B. All pavement marking type options are listed in the order of priority/recommended installations. See Material Information sheet for relative costs.

## Specific Notes:

1. For all AADT > 50,000 and for new concrete interstate, grooving is recommended for all pavement marking types in ultimate build out conditions (full width) with no anticipated long term lane line changes.
2. All epoxy permitted by Special Provision only. Manufacturer's warranty should be required.
3. Roadway lighting increases the visibility of tape installed in urban areas.

## Pavement Marking Material Information

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| Material   | Estimated Cost per linear foot <sup>2</sup> (2008) dollars) | Actual Performance on Utah Roads <sup>1</sup> | Manufacturers Estimated Life of Product | Application Temperature  | Initial Retroreflectivity (mcd/m <sup>2</sup> /lux) | Advantages  | Disadvantages  |
|--|---|---|---|--|---|---|--|
| <b>Water Paint - Water-borne (alkyd formula)</b> | \$0.03 - \$0.05   | 7.5-34 Months                                 | 9 - 36 Months                           | Air and pavement temperature above 32°F  | 275 - white<br>180 -yellow (beads - 8 lbs/gallon)   | Inexpensive<br>Quick-drying<br>Longer life on low-volume roads<br>Easy clean-up and disposal<br>No collection of hazardous waste products                                   | Short life on high-volume roads<br>Subject to damage from sands/abrasives<br>Bead application required<br>Does not adhere as well to concrete<br>Pavement must be warm or it will not adhere                 |
| <b>Epoxy</b>                                     | \$0.20 - \$0.30   | 31-46 Months                                  | 36-48 Months                            | Air and pavement temperature above 50°F  | 300 - white<br>200 - yellow (beads - 25 lbs/gallon) | Longer life on low and high volume roads<br>More retroreflective  | Slow-drying<br>Requires coning and flagging during application<br>Heavy bead application required which will need to be cleaned off of roadway<br>High initial expense<br>Subject to damaged sands/abrasives |
| <b>Thermoplastic</b>                             | N/A   | Data pending                                  | 36 - 72 Months                          | All temperatures   | 275 - white<br>180 -yellow                          | Long life on low and high volume roads<br>Retroreflective<br>No beads needed<br>Any temperature for application   | Subject to damage from sands/abrasives<br>May suffer snowplow damage   |
| <b>Tape</b>                                      | \$1.50 - \$2.65   | 25-95 Months                                  | 48 - 96 Months                          | Minimum temperature:<br>Air-60°F<br>Pavement - 70°F<br>bituminous - 120° - 150°F | 350 - white<br>250 - yellow                         | Highly retroreflective<br>Long life on low and high volume roads<br>Useful in high traffic areas<br>Reduces worker exposure to road hazards because of long life            | High initial expense<br>Best when only used on new surfaces (not worth the expense to use on older roads)<br>May suffer snowplow damage  |
| <b>PolyUrea</b>                                  | \$1.50 - \$2.00   | 36-72 Months                                  | 24-36 Months                            | Minimum temperature:<br>Air-40°F<br>Pavement - 40°F                              | 725 - white<br>560 - yellow                         | Quick-drying<br>Lower temperature for application<br>Non-yellowing binder<br>Good adhesion and retro readings on concrete<br>Predicted life comparable to tape at less cost | Untested on asphalt in Utah  |

1. Based on decaying exponential trendline modeling of currently compiled retroreflectivity data.

2. Add \$0.50/ft for diamond grind grooving

